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(54) Title: APPARATUS AND METHOD OF MOVING MICRO-DROPLETS USING LASER-INDUCED THERMAL GRADIENTS

(57) Abstract: Described are an apparatus and method of moving micro-droplets. A surface has a liquid phase thereon. In the liquid phase is a droplet. Focused at an edge of the droplet is a beam of light. The light beam produces a thermal gradient sufficient to induce the droplet to move according to the Marangoni effect. The movement-inducing thermal gradient may appear within the droplet or within the liquid phase. The composition of the droplet, the liquid phase, and wavelength of the light beam can cooperate to cause heating within the droplet, liquid phase, or both. For example, an infrared laser can cause vibration of an O-H stretch in an aqueous droplet (or in the liquid phase). As another example, adding dye to a droplet or to the liquid phase enables absorption of light from an Argon ion laser. The apparatus and method find particular use in biological and chemical high-throughput assays.



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